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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
| 09/883,851 | 06/18/2001 | Bogdan C. Maglich | HIENER.1CPC1CP | 9955 |
| 20995 7590 04/06/2007 KNOBBE MARTENS OLSON & BEAR LLP 2040 MAIN STREET FOURTEENTH FLOOR IRVINE, CA 92614 | | | EXAMINER GREENE, DANIEL LAWSON | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 3694 | |
| SHORTENED STATUTORY PERIOD OF RESPONSE | | NOTIFICATION DATE | DELIVERY MODE | |
| 3 MONTHS | | 04/06/2007 | ELECTRONIC | |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/06/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

jcartee@kmob.com
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| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 09/883,851 | MAGLICH, BOGDAN C. | |
| | Examiner | Art Unit | |
| | Daniel L. Greene Jr. | 3694 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/21/05, 3/14/06 AND 2/14/06.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11/21/2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input checked="" type="checkbox"/> Other: <u>See Continuation Sheet</u> . |

Continuation of Attachment(s) 6). Other: 37 CFR 1.105 Requirement for Information ~~AND 37 CFR 1.91 requirement for a~~
~~working model.~~ ~~1/27~~

DETAILED ACTION

1. Receipt of Applicant 3/9/2007 Revocation of Power of Attorney is acknowledged.
2. Receipt of Applicants 12/14/2006 "Response to June 12, 2006 Notice of Non-Compliant Appeal Brief" is also acknowledged. Upon consideration of Applicant's remarks contained therein and the situations that exist in the instant and other co-pending Applications, it has been decided to reopen prosecution in order to allow Applicant to respond to the 37 CFR 1.105 request for information contained within the instant Office action.
3. Accordingly, the Finality of the Last office action mailed 8/19/2005 is hereby withdrawn.
4. The Examiner will first address the arguments contained within Applicant's 12/14/2006 communication before addressing the merits of the claims with regard to the prior art.
5. Since examination of the instant Application has been reopened, all arguments directed toward the June 12, 2006 notice regarding the Appeal Brief filed March 10, 2006 are moot.
6. Upon review of Applicant's arguments surrounding the Protest, it is considered that said Protest was indeed neither timely filed nor served upon Applicant himself. Further, Applicant has not given explicit permission to consider said protest. Accordingly, the Protest will NOT be entered into the record and the Original has been attached to an Office action of Applicant's copending application 09/788,736.

7. Regarding applicant's remarks directed toward the manner in which the Examiner was made aware of the protest, Applicant must understand that the instant Application is available for PUBLIC inspection and review on the USPTO's website via public PAIR. The Examiners contact information is supplied on the bottom of every Office action and further accessible via said USPTO website and as such there is no way to prevent the submission of information from the public via email, fax, etc.

8. To the best of the Examiners recollection, the protest was emailed as an attachment directly to the Examiner's USPTO email of record (available from the USPTO's website) sometime in May of 2006. The Examiner printed out the attachment and subsequently deleted said email and said attachment. The Examiner has performed a complete review of his computer to ensure no copies exist. The Examiner was able to locate only one copy of the protest, which was attached to Applicant's copending application 09/788,736 and were marked (with post it notes) by the Examiner to not be scanned. A copy **will not** be made to be mailed with the instant Office action. Again, the Examiner has not been able to locate any further copies of said Protest.

9. In this regard, the Examiner has also reviewed the Electronic File wrapper system and has determined that a copy was scanned into the system as an attachment to the 6/12/2006 Office action. The Examiner will have these pages deleted from the system.

10. Regarding Applicant's arguments surrounding MPEP 1901.03, Applicant statement on page 4 of the 12/14/2006 response is correct in that Bogdan Maglich has

Art Unit: 3694

only a few applications presently before the Office and as such it was not difficult to determine to which invention the protest is directed as evidenced by the search below.

| Applications for inventor: MAGLICH, BOGDAN | | | | | | |
|--|----------|-----------|-----------|--------|------------|------------------------|
| | Pat. No. | App. Num. | Patent N. | Status | Date Filed | Inventor Name |
| 1 | | 05/490691 | | 163 | 07/22/1974 | MAGLICH, BOGDAN C. |
| 2 | | 06/124502 | | 161 | 02/25/1980 | MAGLICH, BOGDAN C. |
| 3 | | 06/307432 | | 163 | 10/01/1981 | MAGLICH, BOGDAN C. |
| 4 | | 06/833128 | 4786024 | 150 | 02/24/1986 | MAGLICH, BOGDAN |
| 5 | | 60/075037 | | 159 | 02/18/1998 | MAGLICH, BOGDAN |
| 6 | | 09/252359 | | 161 | 02/17/1999 | MAGLICH, BOGDAN C. |
| 7 | | 09/265043 | | 161 | 03/09/1999 | MAGLICH, BOGDAN CASTLE |
| 8 | | 60/213373 | | 159 | 06/23/2000 | MAGLICH, BOGDAN CASTLE |
| 9 | | 09/788736 | | 121 | 02/20/2001 | MAGLICH, BOGDAN C. |
| 10 | | 09/883851 | | 121 | 06/18/2001 | MAGLICH, BOGDAN C. |
| 11 | | 11/084963 | | 061 | 03/21/2005 | MAGLICH, BOGDAN C. |
| 12 | | 11/087899 | | 061 | 03/23/2005 | MAGLICH, BOGDAN C. |
| 13 | | 11/099739 | | 061 | 04/06/2005 | MAGLICH, BOGDAN C. |
| 14 | | 11/099749 | | 161 | 04/06/2005 | MAGLICH, BOGDAN C. |
| 15 | | 11/295746 | | 041 | 12/06/2005 | MAGLICH, BOGDAN C. |
| 16 | | 60/858198 | | 020 | 11/09/2006 | MAGLICH, BOGDAN C. |

11. Section 1900 of the MPEP is clear as to the process of handling a Protest and as such, since the protest appears to have been submitted improperly, cannot and has not been considered nor entered into the record. The Examiner will ensure that the record is indeed sanitized of said protest, and all communications and comments directed toward said protest should be disregarded.

12. It is unclear how the Examiner should respond to the last paragraph on page 5 regarding Dr. Tunnell, however, for Applicant's benefit, the Examiner would like to ensure Applicant that no unauthorized ex-parte communications regarding the merits of and the specific inventions set forth in the applications pending before the USPTO has

taken place. Indeed, the peculiar circumstances surrounding Applicant's inventive concept have heightened the Examiners concern to ensure that ALL of Applicant's applications are prosecuted in accordance with and under all proper applicable statutes.

Further, the Examiner has in no way commented on any issues raised in said protest. Merely made Applicant aware of said protest and given Applicant the ability to respond. Applicant has responded in kind.

13. Accordingly, the Notice of Non-Compliant Appeal Brief mailed 6/12/2006 is hereby withdrawn and the communication (i.e. protest) has not been entered nor considered. Further, the requirement for additional information set forth in said Notice of Non-Compliant Appeal Brief is also withdrawn in lieu of a more detailed request set forth below.

Response to Appeal Brief

14. It appears that the most recent and applicable arguments directed towards the pending claims are set forth within the Appeal Brief filed 3/14/2006. Accordingly, the following Office action will address pending claims 1-17, as claims 26-30 were cancelled without prejudice in said Appeal Brief.

15. Regarding the 12/5/2005 Advisory action and the assertion that claims 1-17 are directed towards a non-elected invention, applicant's arguments are persuasive. Accordingly said assertion is hereby withdrawn.

AFFIDAVIT

16. Applicant's Affidavit received 11/21/2005 is acknowledged. Since applicant has sworn that his declaration is true under penalty of Section 1001, Title 18 of the United States Code in that the invention set forth in his applications is indeed his own and that others were merely consulted for the performance of measurements, then the 102(f) rejection set forth in section 5 of the previous Office action mailed 8/17/2005 is hereby withdrawn.

Drawings

17. The drawings received on 11/21/2006 appear acceptable for the purposes of Examination however they are objected to below because they fail to show how and in what manner the material to be analyzed is capable of being located at a distance smaller than the particle detector array.

18. The drawings are objected to under 37 CFR 1.83(a) because they fail to show the manner in which the material to be analyzed is capable of being placed either outside or inside the target box as described on page 25 of the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the

Art Unit: 3694

appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

This requirement is necessary for a complete understanding of Applicant's invention as explained in more detail below. For example, it is not seen how and in what manner the material to be analyzed is introduced within the SEALED tube neutron generator, nor how and in what manner the target and the material could occupy the exact same location.

Response to Arguments

19. Applicant's arguments, see pages 6-11 of said Appeal Brief, regarding the 35 U.S.C 102(b) rejection set forth in section 3 of the Final Office action mailed 8/19/2005 have been fully considered but they are not persuasive.

Applicant appears to be arguing that the limitations of where the locations of the particle detector array, the target and the material to be analyzed define

over the Hurley reference. Applicant is not considered correct for at least the following reasons.

Applicant argues:

"Contrary to the Examiner's assertion, the structure disclosed by the Bechtel reference cannot satisfy the structure recited by Claim 1 of the present application by being "placed directly on top of the target material." Appellant notes that, as discussed above with regard to the Examiner's statement from the August 19, 2005 Final Office Action, this passage again confuses the "material to be analyzed" with the "target position" recited by Claim 1. Presumably, this passage is meant to state that the target can be placed on the material to be analyzed so that the distance between the alpha particle detector and the target is larger than the distance between the material to be analyzed and the target. However, Figure 8 of the Bechtel reference shows that this configuration is not possible. In Figure 8 of the Bechtel reference, the PSPMT (position-sensitive PMT) is adjacent to the STNG (sealed tube neutron generator) at the center of a 3-ft.-by-3-11, mass of high-density polyethylene shielding. The test object shown in this figure cannot be placed closer to the source of neutrons (i.e., the STNG) than is the alpha particle detector array (i.e., the PSPMT). Therefore, the structure disclosed by the Bechtel reference is not "inherently capable of being placed ... so that the distances mirror those claimed," as asserted by the Examiner."

RESPONSE: Applicant appears to be singling out one figure of the Bechtel reference in order to support his position of the argument. However it is considered that applicant himself has the same issues with his own invention. For example, a comparison of figure 8 of the Bechtel reference and Figure 1 of Applicants own invention is shown below. Note how they both have polyethylene shielding.

Art Unit: 3694

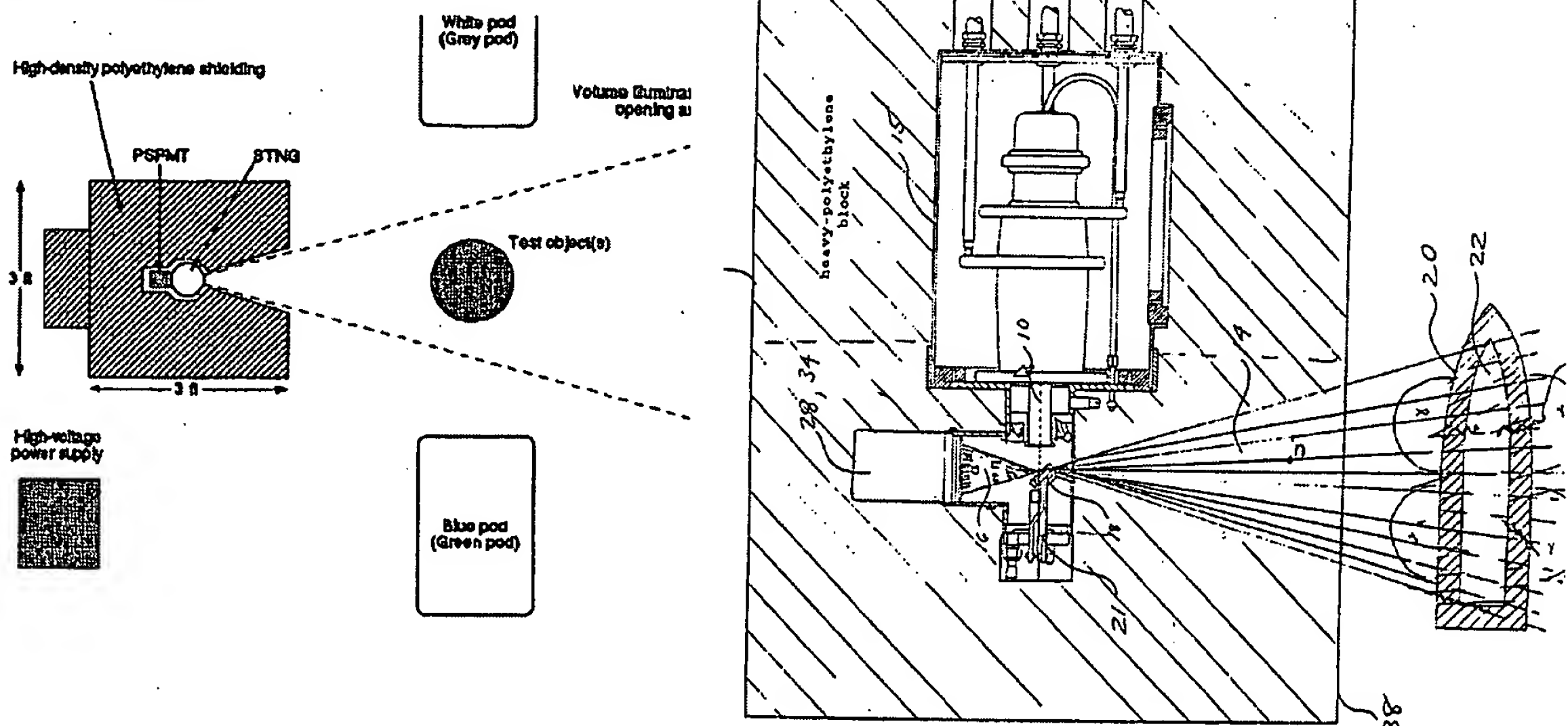
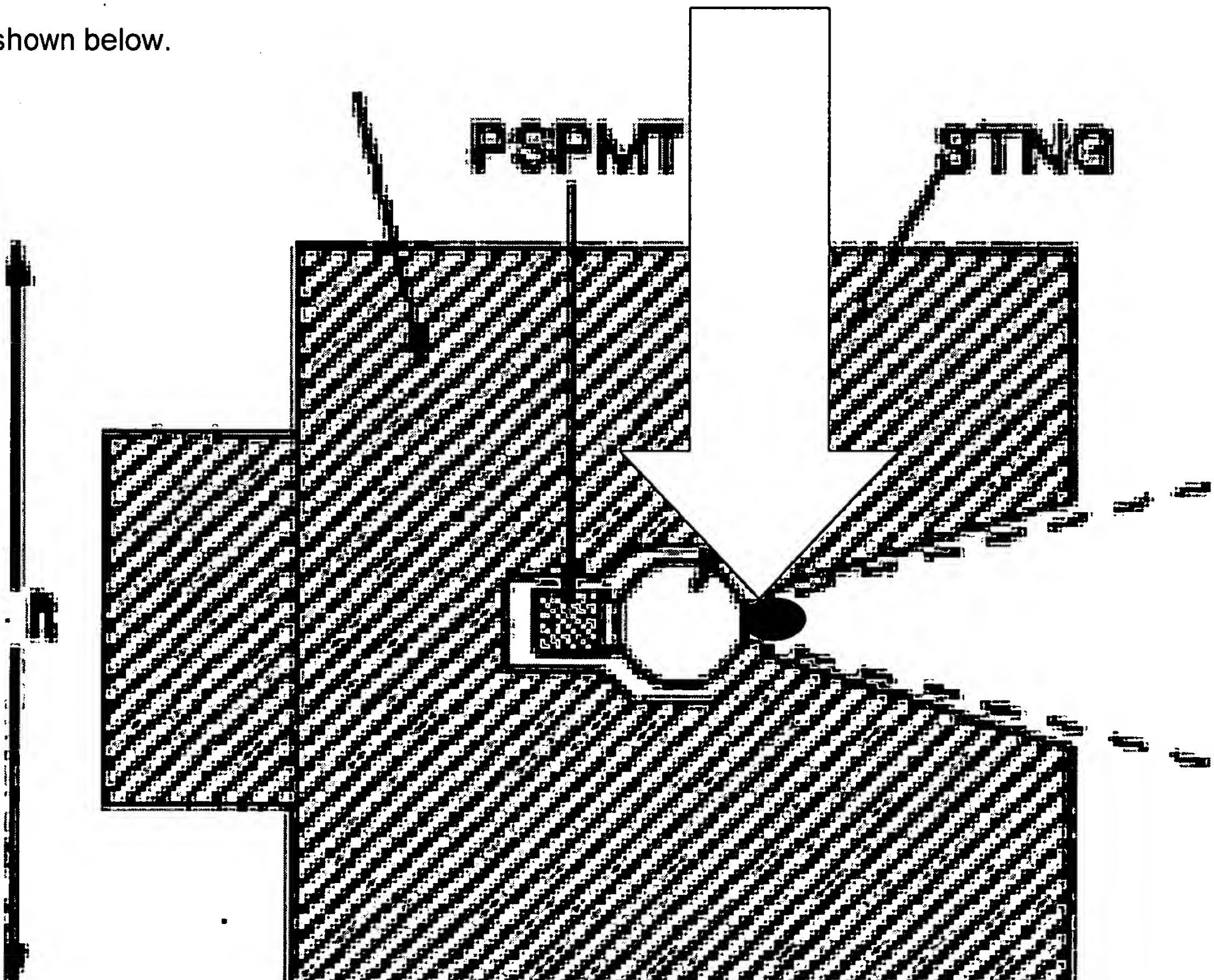
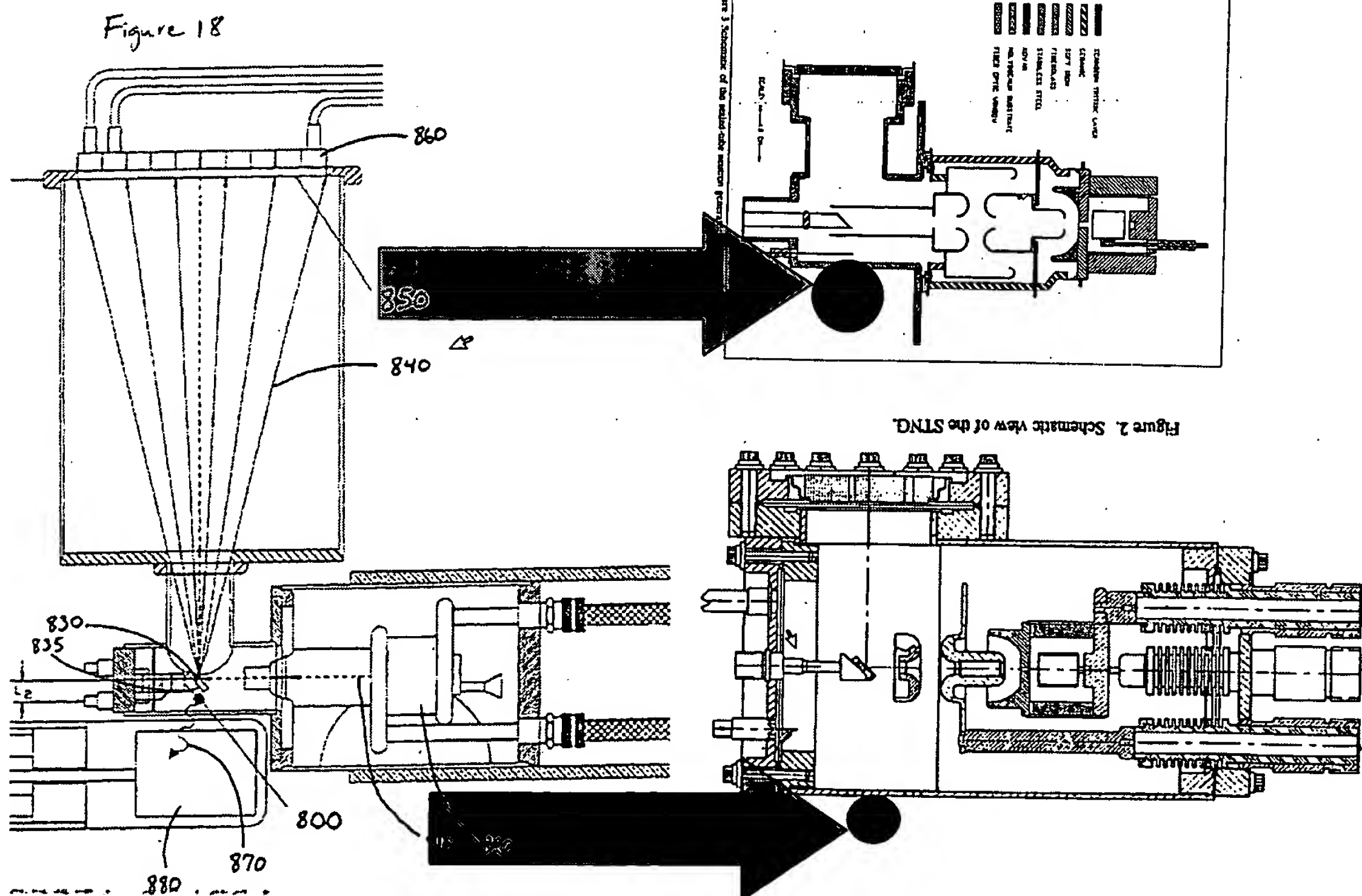


Figure 8. Layout of the API laboratory at STL.

There is no reason why the target material of Figure 8 cannot be located in the same position as claimed in applicants claim 1 by merely moving the target closer as shown below.



For another way to explain how the reference is inherently capable of being situated as applicant claims, let's turn to Figure 18 of Applicant's invention, Figure 2 of the Bechtel reference and figure 3 of the Hurley reference (Current Status of the Associated Particle Imaging system at STL, 1992) (both of which have been rotated to allow ease of viewing corresponding features. Note that the Bechtel reference is a later report of the Hurley reference and as such the figures are considered synonymous and/or interchangeable as representations of the inventions disclosed therein. Clearly, if the black dots shown below are the material to be analyzed, then the distance between the target material and particle detector array is indeed larger than the distance between the target position and the material to be analyzed.



Again, the Bechtel reference is indeed inherently capable of being positioned as claimed.

Applicant's arguments are synonymous to saying that a picture taken with a camera close up is patentable over a picture taken with a camera farther away.

Applicant has not argued that the Bechtel reference does not perform energy filtering within the instant application, however in order to address possible future arguments thereto the Examiner offers the following. The limitation "energy filtering" appears to be an issue of contention in Applicant's copending applications, however the Bechtel reference is considered as clearly setting forth the step of energy filtering for at least the following reasons. First, as Bechtel so aptly states "The first is an energy signal which is shaped and presented to a digitizer if a logic gate determines that the event is valid." This statement clearly indicates that the energy signal will only be "shaped and presented... if a logic gate determines the event is valid". Clearly this sets forth that only those energy signals that the logic gate determines are valid will continue to be processed. The "logic gate" is therefor acting as a "filter" that will only allow the energy signals to be processed if they are valid. Accordingly it is considered that the logic gate is filtering out those energies that are NOT valid and as such "energy filtering" is taking place. Second, Bechtel clearly sets forth a Constant Fraction Discriminator (CFD) and that Bechtel does indeed "energy filter" the plurality of gamma detection signals by using the CFD (Constant

Fraction Discriminator). However for applicant's benefit the Examiner will even further expound upon the limitation "energy filtering".

A review of, for example, ORTEC 583B Constant-Fraction Differential Discriminator/SCA, first page, middle column, second to last paragraph, ORTEC Timing, page 2 "Timing with Scintillation Detectors", page 3 "Coincidence Spectroscopy Systems", page 4, "Selecting the Type of Radiation by Pulse-Shape Analysis", U.S. Patent 5,463,220 to Young et al. column 9 lines 10-15, and Canberra Timing and Coincidence Counting, page 3, second column, show that the Examiners contentions of what a CFD does, is intended for and is capable of performing are correct. That is according to 583B "the energy selection and coincidence decisions can be made before the time-to-amplitude conversion.", Timing "only pulses within the selected energy windows will contribute", "the window is adjusted to select a single gamma ray energy", "the system will record only the energy spectrum caused by neutrons", Young et al. "CFD 94 is parameterized to accept signals corresponding to the start anode output corresponding to the star anode output generated by a fission fragment and to reject smaller signals generated by an alpha particle." and Canberra "Since the differentiator is essentially a high pass filter, the energy information contained..."

For arguments sake, lets consider that the Bechtel doesn't actually perform energy filtering like Applicant alleges. Applicant argues that energy filtering produces a faster response time because less of the gamma detection

signals have to be processed by the rest of the apparatus. This does not appear correct because it is considered that applicant may have actually increased the response time of his invention over those inventions already of record because he has added another filtration step to each and every gamma detection signal. Now every detected gamma must be determined to either be a signal of interest or not, that is each and every event must be filtered BEFORE it can continue through the rest of the system instead of recording each and every event and then performing the data analysis later. This would actually appear to be a step backwards.

Regardless of how Applicant could interpret the Bechtel reference, the fact remains that the CFD is indeed performing energy filtering. It is considered that another way the energy filtering is going on is the energy signal is shaped and presented to a digitizer ONLY IF A LOGIC GATE DETERMINES THAT THE EVENT IS VALID and it is the CFD that aids in the determination of this as shown by figure 10. It appears that the CFD is energy filtering in more ways than one. Therefore since the CFD is indeed energy filtering the signals, it falls to reason that the coincidence detection is performed on said energy-filtered gamma signals and as such Bechtel is indeed "energy filtering"

The Examiner has provided said explanation for the benefit of Applicant, however it is noted that the Bechtel reference need only be capable of Applicant's desired or intended use of energy filtering.

There is well settled case laws that statements as to possible future acts or to what may happen in a method or operation, are essentially method limitations or statements of intended or desired use and do not serve to patentably distinguish the claimed structure over that of the references. See In Re Pearson, 181 USPQ 641; In re Yanush, 177 USPQ 705; In re Finsterwalder, 168 USPQ 530; In re Casey, 152 USPQ 235; In re Otto, 136 USPQ 458; Ex parte Masham, 2 USPQ 2nd 1647.

See MPEP 2114 which states:

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ 2nd 1647.

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than functions. In re Danly, 120 USPQ 528, 531.

Apparatus claims cover what a device is, not what a device does. Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ 2nd 1525, 1528

As set forth in MPEP 2115, a recitation in a claim to the material or article worked upon, does not serve to limit an apparatus claim.

Claim Rejections - 35 USC § 112

20. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

21. Claims 1-17 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. the manner in which applicant is able to actually image a material to be analyzed, which is critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

See the detailed discussion of this matter in section 23c below.

22. Claims 1-17 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. The manner of how the material to be analyzed and imaged is to be located within the confines of the APSTNG i.e. located within the target box, which is critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

a. It is not seen how the material to be analyzed is capable of being located within a "conventionally available APSTNG. Applicant is hereby required to submit evidence of how and in what manner such is possible.

b. It is not seen how the material to be imaged is capable of producing a clear image because the D/T ion beam is not a point source but an extended source.

23. Claims 1-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter

which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

a. Page 25 of the specification as filed sets forth "In Figure 18 the object diamond 800 is drawn outside target box 835 for clarity; in practice, it is placed inside target box 835..." It is not seen how in fact this is possible because the APSTNG is a SEALED tube neutron generator that contains Deuterium gas. It is not seen wherein Applicant has set forth a manner in which to load material to be analyzed in the target of the APSTNG. Further, it is not seen wherein either the specification or the drawings set forth how such is possible.

b. Claims 1 and 5 set forth that the material to be analyzed is closer to the target material than the particle detector array that deciphers the alpha emissions coordinates, however applicant has failed to set forth how and in what manner imaging may be possible at all. Applicant states (see page 25 of the specification) that the material to be analyzed is placed in the target box with a distance of .3cm, i.e. 3mm however the specification is silent as to how such is possible. It is the examiners contention that such is indeed NOT possible nor feasible. For example, it is impractical to locate a material to be analyzed that close to the target material because if said material is not within the APSTNG then it stands to reason that the walls of the APSTNG are at least that close to the target material. This does not appear possible due to the potential of voltage breakdown between electrode structures and the walls of the tube. That is, the

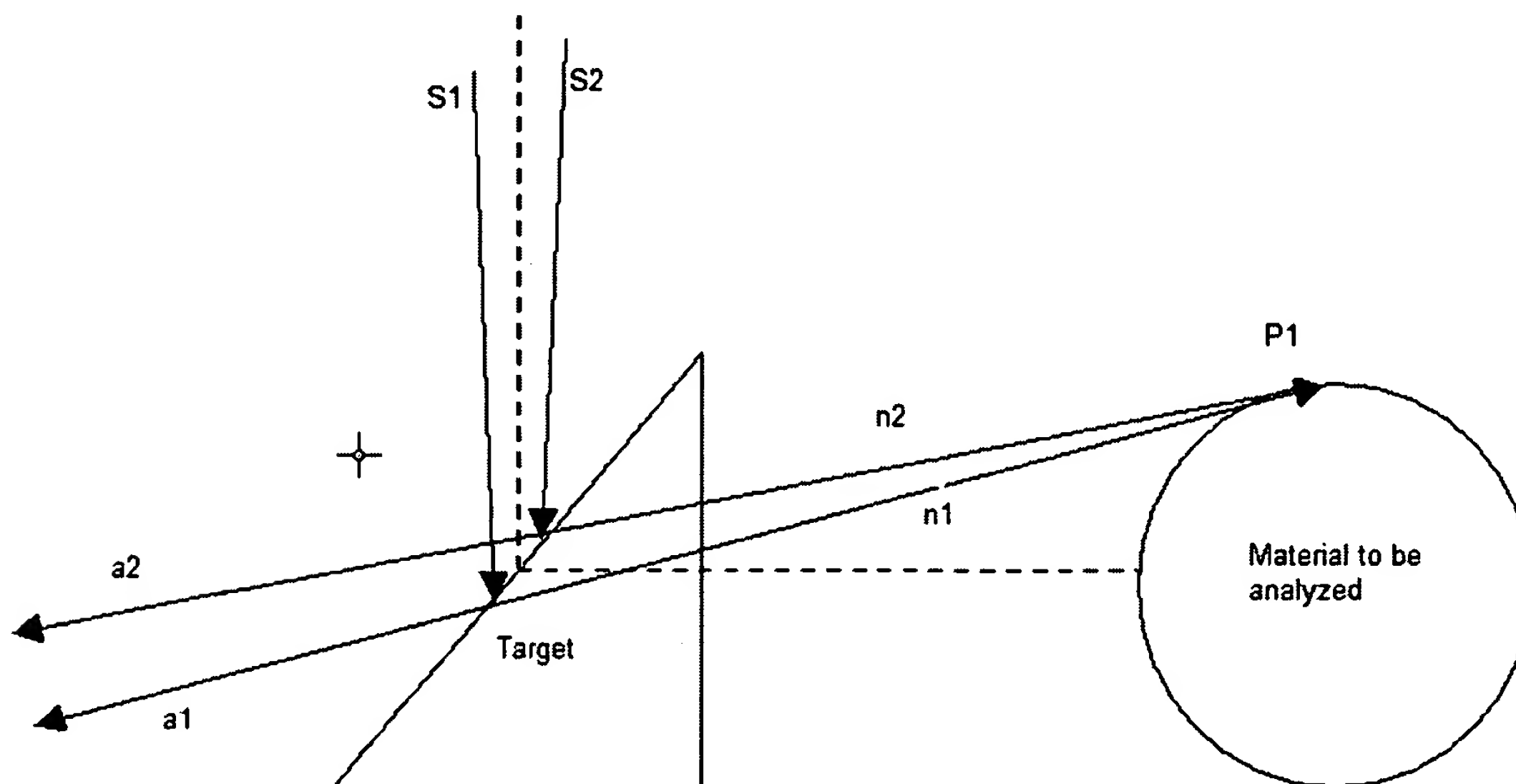
electrode and voltage requirements necessary to encourage the D-T reaction to produce neutrons put a lower limit on the tube dimensions. See section 4.1.1 The STNG tube of the Bechtel reference and section 2.1 of the Hurley reference.

c. Claims 1 and 5 set forth "a system for...imaging of...a material to be analyzed" however it is not seen wherein the specification sets forth how such is possible. The specification sets forth dimensions and theory of how the invention may work however the Examiner has the following contentions.

c1. How does applicant focus the D/T ion beam to a point source?

c2. How does applicant provide a useful tube life if in fact he is able to focus the D/T ion beam to a point source?

c3. How does applicant actually produce an image of the material to be analyzed?



Support for the Examiners contentions may be had in the following discussion of the above representation of the target and material to be analyzed which is an enlargement of figure 18 of the instant application.

One can see that the paths of two candidate source particles S1 and S2 are shown impinging on the target. S1 is representative of the left most edge of the nominal source beam, that is, the left most side of the smallest beam capable of being directed at the target. S2 is representative of the rightmost edge. The distance between S1 and S2 is about 0.7mm. The neutron source is not a point source, but an extended source. This is so that repeated bombardment of the exact same spot doesn't deplete the tritiated target. Such bombardment would reduce the functional lifetime to an unusable extent. This is considered as being supported by applicant's own disclosure. For example, Figure 6 of applicant's disclosure shows the alpha and neutron beam diverging. If the beam causing the reaction were a point source, then it would stand to reason that the beam emitted therefrom would not diverge.

Elementary optics teaches that a target placed so close to an extended source does not produce a clear image. That is why the iris of a camera must be closed tightly (and the exposure lengthened) for close up pictures while the iris must be opened (and the exposure shortened) to take panoramic pictures of mountains in the distance. This phenomenon is true regardless of whether the image plane (in this case the alpha detector) is 115cm (as set forth in the spec) or 11.5cm. The only difference in these two distances would be the size of the

image, that is at 11.5cm the image would be small and fuzzy, while at 115cm the image would be larger, but the fuzziness would be larger by the same amount. Again, resort may be had to standard film processing and enlargement techniques. You can't get a clearer image from a fuzzy negative by merely enlarging it from 5x7 to 8x10, you just get the same fuzzy image on a larger piece of paper. An infinitely small point source would not have this problem but as stated above, the lifetime of a tube with an infinitely small point source would be prohibitively short. Resort may be had to the 1992 Hurley reference pages 8 and 9, section 2.1.3 Beam optics as support for the Examiners contentions. Resort may also be had to page 13, section 2.1.5 Alpha Detector 4th paragraph "The position resolution of the alpha detector, along with the beam spot size, will determine the lateral resolution of the imaging system." Further resort may be had to the same discussion in the Bechtel Nevada reference page 23, section 6.1.

The inherent fuzziness to which the Examiner has explained can be visualized by resorting to the representation above. S1 results in the production of neutron n1 and a corresponding alpha particle a1. The same is true for S2, n2 and a2. In this representation both n1 and n2 impinge upon the same point of the material to be imaged while their corresponding alpha particles would be detected at the surface of the alpha detector, which according to applicants specification is 115cm away. In this example, the same point P1 would be spread over 20cm at the image plane defined by the alpha detector, that is, at

115cm away, the inherent resolution is 20cm which is far to large to image defects as small as applicant asserts.

24. Claims 1-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. Claims 1 and 5 are vague, indefinite and incomplete in what all is meant by and encompassed by the limitation "at a target position which is a first distance from the material to be analyzed;" because it is not seen how the material to be analyzed can be located at said distance as explained in section 23a above, accordingly the metes and bounds of the claims are undefined.

b. Claims 1 and 5 are vague, indefinite and incomplete in what all is meant by and encompassed by the limitation "the second distance being larger than the first distance..." because it is not seen how an image is capable of being created as explained in section 23b above, accordingly the metes and bounds of the claim are undefined.

c. Claims 1 and 5 are vague, indefinite and incomplete in what all is meant by and encompassed by the limitation "imaging of..." because it is not seen how an image is created as explained in section 23c above, accordingly the metes and bounds of the claims are undefined.

Claim Rejections - 35 USC § 102

25. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

26. Claims 1-17 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by the May 1998 publication “ASSOCIATED PARTICLE IMAGING (API)”, from Bechtel Nevada. submitted with applicant’s IDS dated 15 June 2005.

Bechtel Nevada, clearly discloses, throughout the entire document, claims 1-17, a system for non-invasive stoichiometric detection and imaging of chemical elements and compounds in a material to be analyzed (see, for example page 1, section 1.0 Summary, etc.), the system comprising:

a particle generator (see, for example, page 4, Figure 2, and section 4.1.1 through section 4.1.2, etc.), the particle generator generating a plurality of first subatomic particles (neutrons, see, for example, page 5 last line of the third paragraph, etc.) and a plurality of second subatomic particles (an alpha particle, see, for example, page 5 second to last line of the third paragraph, etc.) at a target position which is a first distance from the material to be analyzed;

at least one photon detector (see, for example, page 8 section 4.1.3.2 through page 10 section 4.1.3.4, etc.), the at least one photon detector being capable of detecting photons resulting from irradiation of the material to be analyzed by the first subatomic particles and generating a plurality of first electrical signals;

a particle detector array (see, for example, page 7, section 4.1.3.1 Recoil Alpha Detectors, etc.) comprising a plurality of particle detectors (reads on the structure disclosed in said section 4.1.3.1 wherein the first and second paragraphs clearly disclose that the dynode plate structure of a conventional photomultiplier is replaced by a set of ten wire grids that preserve the x- and y-coordinates and then continues to describe how each of the two planes of 16 parallel wires of the anode are individually separated by high resistance and “Signals are collected from both ends of each plane for a total of four outputs”, clearly is disclosing a plurality of particle detectors), the detector array at a second distance from the target position, the particle detectors each being capable of detecting at least one second subatomic particle (the alpha) from the particle generator, and generating a plurality of second electrical signals (see, for example, page 8, 1st paragraph, last line, etc); and

an analyzer operatively connected to the particle detector array and the at least one photon detector (See, for example, page 11+ section 4.1.4, Figures 5 and 6, section 4.2 spanning pages 14-19, etc.), comprising:

a processor (see, for example, page 11, section 4.1.4 in its entirety, page 14, Figure 7, etc.), the processor filtering the plurality of first electrical signals so as to produce a plurality of filtered electrical signals (See, for example, page 13, paragraphs 1-3, etc.); and

a plurality of electronic coincidence circuits (see, for example, page 12), the coincidence circuits detecting coincidences occurring between the

plurality of filtered electrical signals and the plurality of second electrical signals.

The examiner has already addressed the issues of the distances and filtered electrical signals in section 19 above and incorporates said section 19 herein. Again, this reference is inherently capable of being used in the manner set forth in the claim and the capability need only be present.

Claim 4 is clearly disclosed in, for example, Section 1.0 Summary on page 1 and section 4.2.4 Data Display spanning pages 18 and 19, etc.

Claim 8 is clearly disclosed in, for example section 2.0 Introduction, etc.

Claim 12 is clearly disclosed in, for example, section 4.1.3.4 High Purity Germanium (HPGe) Detectors on page 10, etc.

Claim 16 is clearly disclosed in the last line of the first paragraph on page 31.

Claim 17 is clearly disclosed in, for example, page 26, section 7.4 Field Experiments spanning pages 29-31, etc.

Claims 2, 3, 5, 6, 7, 9-11, and 13-15 are clearly disclosed in the rejection of corresponding parts above.

27. Claims 1-17 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by the JANUARY 10, 1992 publication "CURRENT STATUS OF THE ASSOCIATED PARTICLE IMAGING SYSTEM AT STL", by HURLEY et al.

NOTE: This reference is an earlier publication of the Bechtel reference cited above but is being cited herein as further evidence of the timeline of the Bechtel reference.

Hurley, clearly discloses, throughout the entire document, claims 1-17, i.e. a system for non-invasive stoichiometric detection and imaging of chemical elements and compounds in a material to be analyzed (see, for example page 1, section 1.0 Introduction, etc.), the system comprising:

a particle generator (see, for example, pages 3+, Figure 2, section 2.1+, etc.), the particle generator generating a plurality of first subatomic particles (neutrons, see, for example, page 1 first line of the third paragraph, etc.) and a plurality of second subatomic particles (an alpha particle, see, for example, page 1 first line of the third paragraph, etc.) at a target position which is a first distance from the material to be analyzed;

at least one photon detector (see, for example, page 14 section 2.2 through page 16, etc.), the at least one photon detector being capable of detecting photons resulting from irradiation of the material to be analyzed by the first subatomic particles and generating a plurality of first electrical signals;

a particle detector array (see, for example, page 13, section 2.1.5 Alpha Detector, etc.) comprising a plurality of particle detectors (reads on the structure disclosed in said section 2.1.5 wherein the last paragraph discloses "a rectangular 60x55 format will probably be used. This implies that the final picture will be about 80 resolution elements wide."), the detector array at a second

distance from the target position, the particle detectors each being capable of detecting at least one second subatomic particle (the alpha) from the particle generator, and generating a plurality of second electrical signals (see, for example, page 17, section 2.3, etc); and

an analyzer operatively connected to the particle detector array and the at least one photon detector (See, for example, page 17, section 2.3, Figure 10, etc.), comprising:

a processor, the processor filtering the plurality of first electrical signals so as to produce a plurality of filtered electrical signals (See, for example, the discussion of this topic in section 19 above); and

a plurality of electronic coincidence circuits (see, for example, page 17 figure 10 and associated text, etc.), the coincidence circuits detecting coincidences occurring between the plurality of filtered electrical signals and the plurality of second electrical signals.

Again, the examiner has already addressed the issues of the distances and filtered electrical signals in section 19 above and incorporates said section 19 herein. Again, this reference is inherently capable of being used in the manner set forth in the claim and the capability need only be present.

Claim 4 is clearly disclosed in, for example, Section 1.0 Summary on page 1 and section 2.5.5 Three-Dimensional Display beginning on page 24, etc.

Claim 8 is clearly disclosed in, for example section 1.0 Introduction, etc. wherein 14 MeV is clearly greater than 1MeV.

Claim 12 is clearly disclosed in, for example, table 2 on page 15, etc.

Claims 16 and 17 are disclosed in, for example, section 3.3 on page 31.

Claims 2, 3, 5, 6, 7, 9-11, and 13-15 are disclosed in the rejection of corresponding parts above.

28. Claims 1-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Rhodes et al. "Substance Detection Systems", 1993, hereinafter Rhodes.

Rhodes, clearly discloses, throughout the entire document, claims 1-17, i.e. a system for non-invasive stoichiometric detection and imaging of chemical elements and compounds in a material to be analyzed (see, for example the Abstract, section 1 Introduction, etc.), the system comprising:

a particle generator (see, for example, Figures 1-15 and associated text, etc.), the particle generator generating a plurality of first subatomic particles (neutrons, see, for example, section 2, figure 4 and associated text, etc.) and a plurality of second subatomic particles (an alpha particle, see, for example, Figure 1 and associated text, etc.) at a target position which is a first distance from the material to be analyzed;

at least one photon detector (see, for example, Figure 1 and associated text, etc.), the at least one photon detector being capable of detecting photons resulting from irradiation of the material to be analyzed by the first subatomic particles and generating a plurality of first electrical signals;

a particle detector array (see, for example, figure 2 "Alpha Detector" and associated text, etc.) comprising a plurality of particle detectors (see, for

example, page 291, the second full paragraph), the detector array at a second distance from the target position, the particle detectors each being capable of detecting at least one second subatomic particle (the alpha) from the particle generator, and generating a plurality of second electrical signals (see, for example, figures 1 and 2 and associated text, etc); and

an analyzer operatively connected to the particle detector array and the at least one photon detector (See, for example, figures 1 and 2 and associated text, etc.), comprising:

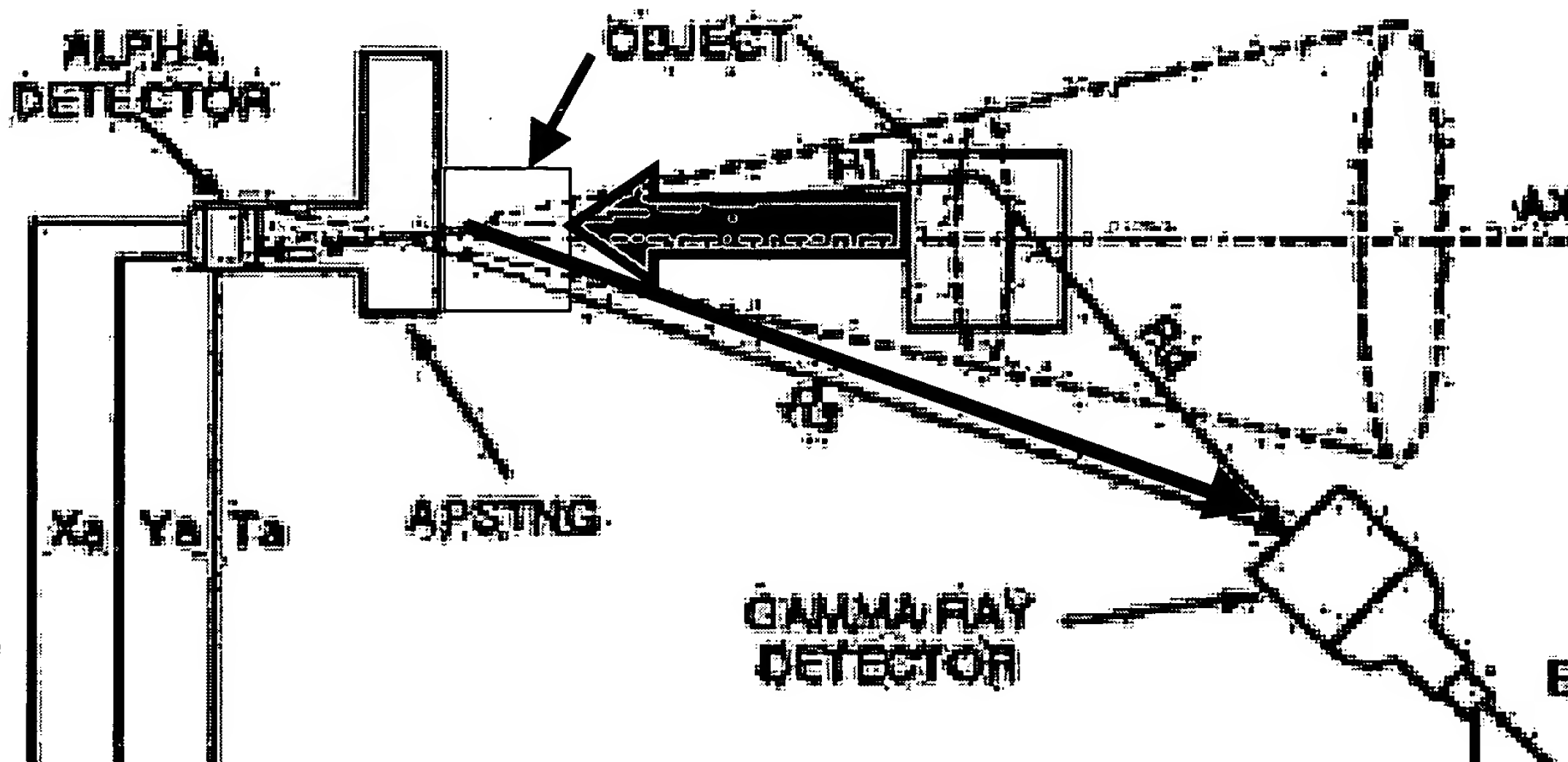
a processor (CFD), the processor filtering the plurality of first electrical signals so as to produce a plurality of filtered electrical signals (See, for example, the discussion of this topic in section 19 above about CFD's); and

a plurality of electronic coincidence circuits (see, for example, figures 1 and 2 and associated text, etc.), the coincidence circuits detecting coincidences occurring between the plurality of filtered electrical signals and the plurality of second electrical signals.

Again, the examiner has already addressed the issues of the distances and filtered electrical signals in section 19 above and incorporates said section 19 herein. Further as shown by the enlarged section of Figure 2 below, Rhodes is inherently capable of being used in the same manner claimed as applicant regarding the distances by merely moving the material to be analyzed closer to

Art Unit: 3694

the APSTNG. Again, this reference is inherently capable of being used in the manner set forth in the claim and the capability need only be present.



Claim 4 is clearly disclosed in, for example, Section 2.1 Detection modes on page 290 and section 3 on page 291, etc.

Claim 8 is clearly disclosed in, for example, the abstract, etc. wherein 14 MeV is clearly greater than 1MeV.

Claim 12 is clearly disclosed on, for example, page 292, third paragraph, third sentence, etc.

Claims 16 and 17 are disclosed in, for example, section 3.2 on page 292, etc.

Art Unit: 3694

Claims 2, 3, 5, 6, 7, 9-11, and 13-15 are disclosed in the rejection of corresponding parts above.

Claim Rejections - 35 USC § 103

29. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

30. **Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bechtel Nevada as applied to claims 1-17 above, and further in view of Vourvopoulos.**

Bechtel Nevada sets forth Applicant's invention as claimed and explained above.

If applicant is of the opinion that the limitation "energy filtering" does not read on the explanations previously given by the Examiner then it is considered general knowledge that a reduction in the amount of data that is required to be processed causes a correlating reduction in the amount of time actually required to process said data. The Examiners statement is well supported by, for example, page 1 wherein it is stated "Interactions between a neutron and the material in its path often produce a gamma ray whose energy is characteristic of that material." This knowledge, along with that of the possible constituents of the

sample and a specific interest in only certain elements, can be used to simplify the problem of elemental identification”, clearly indicating that identifying only specific elements would take less time and Vourvopoulos page 2-42, column 1, the paragraph under Table II, wherein it is taught that in order to decrease the analysis time of a specific sample, several improvements were investigated including a data reduction by including the gamma ray response spectra for all the elements that are expected to be found in the materials to be interrogated. Clearly a review of the other prior art of record shows a common thread and motivation throughout to decrease the investigation time while increasing the resolving power, i.e. the ability to actually detect and classify specific material of interest in the shortest possible time. It would be prima facie obvious that if one were only concerned with a limited range of data, i.e. those gamma detection energies correlating to certain specific elements of interest, one would only desire to process those specific gamma energy detection signals, that is, processing any other data than that specifically required to detect the desired elements would appear to be a waste of time.

At the time of the invention it would have been obvious to one of ordinary skill in the art to energy-filter the plurality of gamma detection signals prior to detecting the coincidences between the gamma detection signals and the detected alpha particles as taught to be old and advantageous by Vourvopoulos for the benefits of decreasing the amount of data the coincidence circuits must process, thus reducing the processing time required for said data as such is

Art Unit: 3694

nothing more than the general knowledge available to those skill in the nuclear spectroscopy art.

31. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hurley et al. as applied to claims 1-17 above, and further in view of Vourvopoulos.

Hurley sets forth Applicant's invention as claimed and explained above.

If applicant is of the opinion that the limitation "energy filtering" does not read on the explanations previously given by the Examiner then it is considered general knowledge that a reduction in the amount of data that is required to be processed causes a correlating reduction in the amount of time actually required to process said data. The Examiners statement is well supported by, for example, Hurley pages 25-26 wherein it is stated "most elements have only a few lines that will appear strongly in a spectrum. This knowledge, along with that of the possible constituents of the sample and a specific interest in only certain elements, can be used to simplify the problem of elemental identification", clearly indicating that identifying only specific elements would take less time and Vourvopoulos page 2-42, column 1, the paragraph under Table II, wherein it is taught that in order to decrease the analysis time of a specific sample, several improvements were investigated including a data reduction by including the gamma ray response spectra for all the elements that are expected to be found in the materials to be interrogated. Clearly a review of the other prior art of record shows a common thread and motivation throughout to decrease the investigation time while increasing the resolving power, i.e. the ability to actually

detect and classify specific material of interest in the shortest possible time. It would be prima facie obvious that if one were only concerned with a limited range of data, i.e. those gamma detection energies correlating to certain specific elements of interest, one would only desire to process those specific gamma energy detection signals, that is, processing any other data than that specifically required to detect the desired elements would appear to be a waste of time.

At the time of the invention it would have been obvious to one of ordinary skill in the art to energy-filter the plurality of gamma detection signals prior to detecting the coincidences between the gamma detection signals and the detected alpha particles as taught to be old and advantageous by Vourvopoulos for the benefits of decreasing the amount of data the coincidence circuits must process, thus reducing the processing time required for said data as such is nothing more than the general knowledge available to those skill in the nuclear spectroscopy art.

32. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rhodes as applied to claims 1-17 above and further in view of page 980 FILTER, electrical of The Illustrated Science and Invention Encyclopedia 1983 (hereinafter page 980).

Rhodes discloses applicant's invention as explained above.

If applicant is of the opinion that Rhodes does not specifically disclose that the plurality of gamma detection signals are filtered prior to further processing, i.e. being utilized in detecting coincidences with the detected alpha particles

(except for setting the threshold voltage of the CFD's as previously discussed above.) then...

Page 980 clearly discloses that it is old and well known to apply an electrical filter to diminish or remove unwanted components of an electrical signal.

At the time of the invention it would have been obvious to employ a filter to the output of the gamma detectors of Rhodes for the benefit of removing unwanted gamma detection signals as taught to be old and well known by page 980 as such is no more in the use of common techniques of processing signals known to those in the neutron spectroscopy art.

Conclusion

33. A requirement for information is attached to the instant Office action beginning on a new page.

34. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure as setting forth the state of the art surrounding applicant's inventive concept.

35. Examiner's Note: The Examiner has cited particular columns and line numbers in the references as applied to the claims for the convenience of the applicant.

Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant, in preparing the


Art Unit: 3694

responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

36. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel L. Greene Jr. whose telephone number is (571) 272-6876. The examiner can normally be reached on Mon-Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James P. Trammell can be reached on (571) 272-6712. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

37. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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2007-03-30


JACK KEITH
SUPERVISORY PATENT EXAMINER

Requirement for information under 37 CFR 1.105.

1. In order to properly consider the invention claimed by Applicant it has been determined that more information is required.
2. **Applicant is hereby required to submit the following information:**
 - a. **Related information:** A copy of any non-patent literature, published application, or patent (U.S. or foreign), by the inventor, that relates to the claimed invention that is not currently of record.
 - b. **Information used to draft application:** A copy of any non-patent literature, published application, or patent (U.S. or foreign) that was used to draft the application.
 - c. **Information used in invention process:** A copy of any non-patent literature, published application, or patent (U.S. or foreign) that was used in the invention process, such as by designing around or providing a solution to accomplish an invention result.
 - d. **Improvements:** Where the claimed invention is an improvement, identification of what is being improved.
 - e. **In Use:** Identification of any use of the claimed invention known to any of the inventors at the time the application was filed notwithstanding the date of the use.
 - f. **Technical information known to applicant:** Technical information known to applicant concerning the related art, the disclosure, the claimed subject matter, other factual information pertinent to patentability, or

concerning the accuracy of the examiner's stated interpretation of such items.

3. Requirements for factual information known to applicant may be presented in any appropriate manner, for example:

- (i) A requirement for factual information;
- (ii) Interrogatories in the form of specific questions seeking applicant's factual knowledge; or
- (iii) Stipulations as to facts with which the applicant may agree or disagree.

4. Any reply to a requirement for information pursuant to this section that states either that the information required to be submitted is unknown to or is not readily available to the party or parties from which it was requested may be accepted as a complete reply.

5. Applicant is specifically required to submit information regarding the "Minebuster" invention set forth in the Declaration received 12/21/2005 including at least a statement of when this invention was conceived, how it was conceived, who, if any, aided in its conception, etc. In this regard, a statement pursuant to this section that states either that the information required to be submitted is unknown to or is not readily available to the party or parties from which it was requested WILL NOT be accepted as a complete reply because it is considered that Applicant is personally intimately familiar with the reduction to practice, "proof of concept" and commercialization of his own invention.

6. Applicant is specifically required to submit a Declaration from Charles Powell and Albert Beyerle as to their interactions and contributions in regard to applicant's Declaration received 12/21/2005.

7. Applicant is specifically required to submit any and all documentation regarding the collaboration with the DOE, EG&G, ORTEC the University of California at Berkley as set forth in said declaration. In this regard, a statement pursuant to this section that states either that the information required to be submitted is unknown to or is not readily available to the party or parties from which it was requested WILL NOT be accepted as a complete reply because it is considered that Applicant is personally intimately familiar with the reduction to practice, "proof of concept" and commercialization of his own invention.

8. Applicant is specifically required to submit any other information that may reasonably construe inventorship of the claimed invention including personal notes, log books, emails, technical papers, etc.

9. Applicant is specifically required to disclose the exact nature of his interactions with James Tinsley, Paul Hurley of Special Technologies Laboratory as evidenced by the Abstract Submitted for the DNP99 Meeting of the American Physical Society. In this regard, a statement pursuant to this section that states either that the information required to be submitted is unknown to or is not readily available to the party or parties from which it was requested WILL NOT be accepted as a complete reply because it is

Art Unit: 3694

considered that Applicant is personally intimately familiar with the reduction to practice, "proof of concept" and commercialization of his own invention.

10 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel L. Greene Jr. whose telephone number is (571) 272-6876. The examiner can normally be reached on Mon-Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James P. Trammell can be reached on (571) 272-6712. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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2007-03-30

JACK KEITH
SUPERVISORY PATENT EXAMINER